

The cruise of the *Marion Dufresne* off the Brazilian coast: account of the scientific results and list of stations

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ABSTRACT

From May 6 to June 2 1987 the *Marion Dufresne* obtained a large series of deep-water samples from off the southeastern Brazilian coast, oceanographic cruise TAAF MD55/Brazil. The MD55 collections include several new species and records from the southwestern Atlantic. Knowledge of the deep water fauna from that region has been broadened as a result of a series of reports published in the last ten years. An account of the scientific results published so far is presented herein.

KEY WORDS

Oceanographic cruise,
deep-water fauna,
southwestern Atlantic,
Brazil.

RÉSUMÉ

La campagne du Marion Dufresne au large de la côte brésilienne : compte-rendu des résultats scientifiques et liste des stations.

Du 6 mai au 2 juin 1987, le *Marion Dufresne* a réalisé une série d'échantillonnages dans les eaux profondes au large du sud-est brésilien : campagne océanographique TAAF MD55/Brésil. Le très riche matériel zoologique récolté, dont une grande partie reste encore à étudier, a donné lieu à une série de publications dans lesquelles plusieurs nouvelles espèces sont décrites et des nombreuses nouvelles répartitions sont établies. À la suite de ces publications, les connaissances sur la faune profonde de l'Atlantique sud-occidental ont considérablement augmenté. Un compte-rendu des résultats scientifiques publiés jusqu'à l'heure actuelle est présenté.

MOTS CLÉS

Campagne océanographique,
faune profonde,
Atlantique sud-occidental,
Brésil.

INTRODUCTION

Not surprisingly, knowledge on the Brazilian deep-sea fauna is still very fragmentary, as much of what has been published about the deep water fauna from that area is largely the outcomes of only a few expeditions conducted occasionally in the late nineteenth century. Three expeditions were responsible for all the deep-sea activities carried out in Brazil during the last century, they are as follow: *Hassler* (1872), *Challenger* (1873), and *Albatross* (1887). Together those three expeditions secured only 30 samples from the deep-sea bed (Tizard *et al.* 1885; Peirce & Patterson 1879; Townsend 1901), yet the *Challenger* reports are a *vade mecum* for those interested in the Southwestern Atlantic deep sea fauna.

No major expeditions were organized to study Brazil's deep-sea macrofauna until 1987, when the *Marion Dufresne* obtained a long series of samples from depths down to 5155 metres. The cruise TAAF MD55/Brazil 1987 was conducted as part of a formal agreement between the Universidade Santa Úrsula, Rio de Janeiro, the Muséum national d'Histoire naturelle, Paris, and the Observatoire océanologique de Banyuls, Banyuls-sur-Mer, Laboratoire Arago, Université de Paris VI.

A detailed description of the cruise general characteristics can be found in Guille & Ramos (1988). Opportunity is taken herein to give an account of the scientific results published so far. Some of the references in the list of the scientific publications based on the MD55 collections were compiled by José Henrique Leal (Bailey-Matthews Shell Museum, Sanibel Island, Florida) and Virginie Heros (Muséum national d'Histoire naturelle, Paris).

CRUISE PARTICIPANTS

ABBREVIATIONS

| | |
|------|--|
| CFR | Centre de Faibles Radioactivités, Gif-sur-Yvette; |
| INCM | Institut national des Sciences de la Mer, Cherbourg; |
| IST | Institut des Sciences de la Terre, Dijon; |
| MNHN | Muséum national d'Histoire naturelle, Paris; |

| | |
|------|---|
| MNRJ | Museu Nacional, Rio de Janeiro; |
| LA | Observatoire océanologique de Banyuls-sur-Mer, Laboratoire Arago; |
| SME | Station Marine d'Endoume, Marseille; |
| USP | Universidade de São Paulo; |
| USU | Universidade Santa Úrsula, Rio de Janeiro. |

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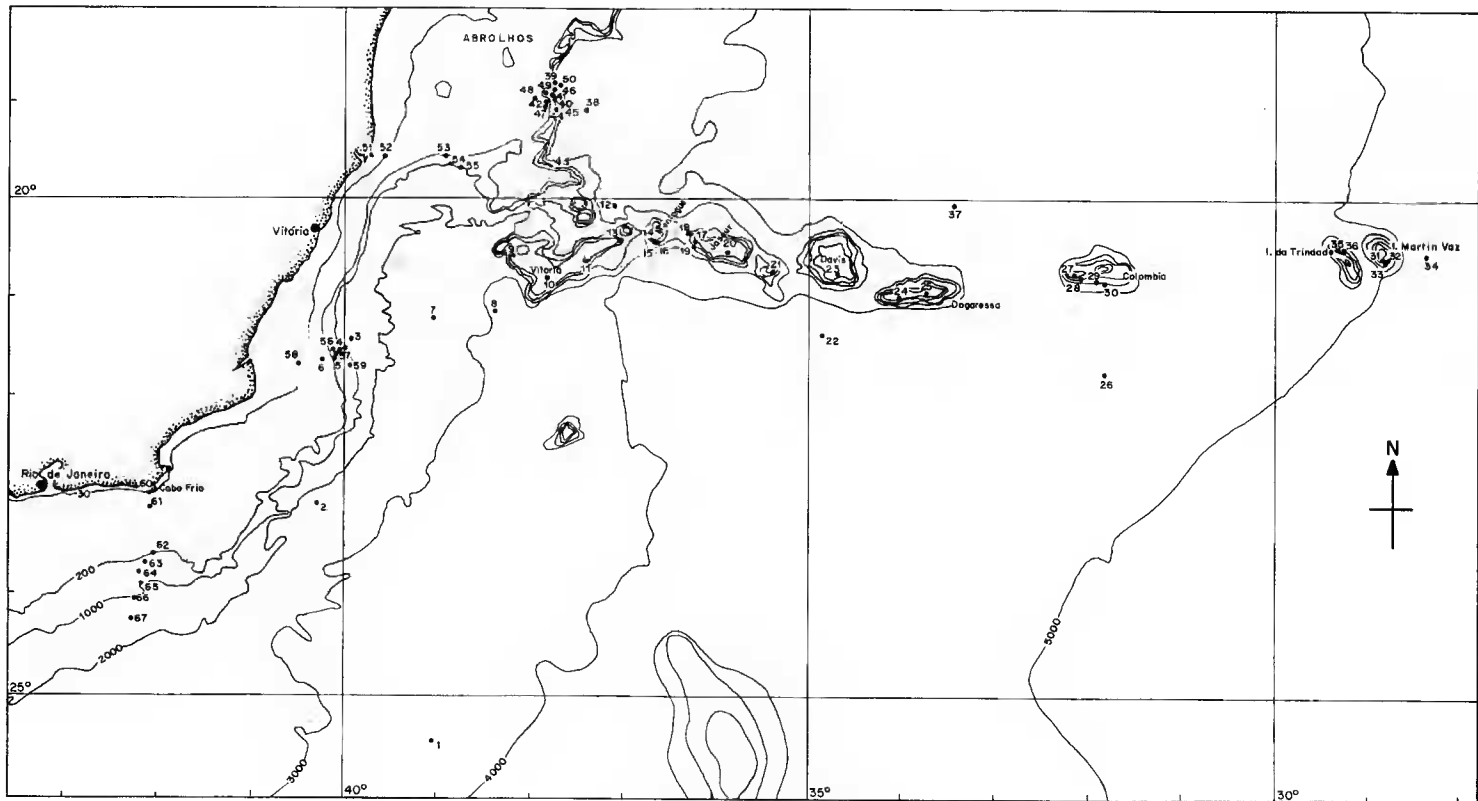


Fig. 1.— Area sampled by the *Marion Dufresne* in 1987.

ITINERARY AND COLLECTING ACTIVITY

The *Marion Dufresne* departed from Rio de Janeiro on May 6 1987. Twenty-eight days and twenty hours were spent between depart and return to Rio de Janeiro on June 2. During this period, 3180 sea-miles were covered to survey 67 stations, where 108 benthic and 143 pelagic operations were conducted between 15 and 5155 meters depth (Fig. 1).

From Rio de Janeiro's harbour the *Marion Dufresne* headed south, straight to the abyssal plain (stn 1). Afterwards the ship moved northward to survey the abyssal plain and the continental margin south of Vitória (stn 2-8). The numerous oceanographic activities carried out in different depths along the seamounts of the Vitória-Trindade chain (stn 9-38) aimed primarily to study the faunistic transition with depth and the effects of insularity in deep waters. Additionally, a number of samples were obtained from the Abrolhos submarine canyons (stn 39-50). In order to compare faunistic transitions with depth on a isolated seamount and along the continental margin, two transects were performed near Rio Doce (stn 51-55) and Cabo Frio (Fig. 1, stn 60-67). While heading from Rio Doce to Cabo Frio, additional surveys were done on the continental margin south of Vitória (stn 56-59).

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Appendix

Stations list of the oceanographic cruise TAAF MD55/BRAZIL 1987

ABBREVIATIONS

CB Blake trawl;
 CP Beam trawl;
 DC Charcot dredge;
 Pk pelagos;
 Stn station;
 SY box core.

Depths are given in metres.

| Station | Date | Depth | Latitude | Longitude |
|-------------|-----------|-----------|----------|-----------|
| Stn 1 Pk | 7.V.1987 | 3975 | 25°25'3S | 39°01'9W |
| Stn 2 CP01 | 8.V.1987 | 2370-2380 | 23°04'3S | 40°19'9W |
| Stn 2 CP02 | 9.V.1987 | 1900-1950 | 22°57'6S | 40°20'5W |
| Stn 2 SY03 | 9.V.1987 | 1835-1872 | 22°50'9S | 40°15'4W |
| Stn 2 Pk | 8.V.1987 | 2400 | 23°05'5S | 40°20'7W |
| Stn 3 CP04 | 9.V.1987 | 1320-1360 | 21°24'2S | 39°56'2W |
| Stn 3 DS05 | 9.V.1987 | 1400-1420 | 21°25'5S | 39°56'4W |
| Stn 3 SY06 | 9.V.1987 | 1460 | 21°28'6S | 39°55'7W |
| Stn 3 Pk | 9.V.1987 | 1320 | 21°24'2S | 39°56'3W |
| Stn 4 CP07 | 10.V.1987 | 750-785 | 21°31'4S | 40°06'8W |
| Stn 4 DS08 | 10.V.1987 | 750 | 21°34'6S | 40°05'4W |
| Stn 4 SY09 | 10.V.1987 | 780 | 21°37'8S | 40°03'0W |
| Stn 4 Pk | 10.V.1987 | 800 | 21°28'1S | 40°08'4W |
| Stn 5 DC10 | 10.V.1987 | 300-307 | 21°34'5S | 40°10'9W |
| Stn 5 CP11 | 10.V.1987 | 248-262 | 21°35'0S | 40°06'2W |
| Stn 5 DS12 | 10.V.1987 | 450-457 | 21°35'5S | 40°02'9W |
| Stn 5 SY13 | 11.V.1987 | 352 | 21°39'1S | 40°05'8W |
| Stn 5 Pk | 11.V.1987 | 412 | 21°39'5S | 40°05'4W |
| Stn 6 SY14 | 11.V.1987 | 42 | 21°37'7S | 40°15'5W |
| Stn 6 DC15 | 11.V.1987 | 37 | 21°37'1S | 40°18'1W |
| Stn 6 Pk | 11.V.1987 | 42 | 21°39'2S | 40°16'6W |
| Stn 7 KU16 | 11.V.1987 | 2420 | 21°14'5S | 39°03'7W |
| Stn 8 CP17 | 11.V.1987 | 3250-3270 | 21°08'4S | 38°24'6W |
| Stn 8 DS18 | 12.V.1987 | 3340 | 21°14'3S | 38°16'0W |
| Stn 8 DS19 | 12.V.1987 | 3400 | 21°16'3S | 38°12'0W |
| Stn 8 SY20 | 12.V.1987 | 3335 | 21°15'9S | 38°08'1W |
| Stn 8 SY21 | 13.V.1987 | 3225 | 21°04'9S | 38°13'9W |
| Stn 8 Pk | 13.V.1987 | 3187 | 21°04'4S | 38°15'6W |
| Stn 9 DC22 | 13.V.1987 | 52 | 20°32'4S | 38°10'5W |
| Stn 10 CP23 | 13.V.1987 | 52 | 20°43'1S | 37°50'1W |
| Stn 10 DC24 | 13.V.1987 | 48-52 | 20°41'8S | 37°49'5W |
| Stn 11 CP25 | 14.V.1987 | 65 | 20°35'8S | 37°27'4W |
| Stn 11 Pk | 14.V.1987 | 63 | 20°33'8S | 37°26'1W |
| Stn 12 Pk | 14.V.1987 | 3140 | 20°09'0S | 37°00'1W |
| Stn 12 Pk | 14.V.1987 | 3150 | 20°08'9S | 37°01'2W |
| Stn 13 DC26 | 14.V.1987 | 97 | 20°21'1S | 36°59'4W |
| Stn 13 Pk | 14.V.1987 | 97 | 20°20'6S | 36°59'2W |
| Stn 14 DC27 | 14.V.1987 | 81 | 20°25'6S | 36°42'3W |
| Stn 15 DC28 | 14.V.1987 | 525-600 | 20°26'8S | 36°41'9W |
| Stn 15 Pk | 14.V.1987 | 772 | 20°26'4S | 36°41'7W |
| Stn 16 DC29 | 14.V.1987 | 310-350 | 20°26'5S | 36°41'4W |

| Station | Date | Depth | Latitude | Longitude |
|-------------|-----------|-----------|----------|-----------|
| Stn 17 DC30 | 15.V.1987 | 60 | 20°26'8S | 36°17'3W |
| Stn 17 CP31 | 15.V.1987 | 60-211 | 20°26'1S | 36°16'3W |
| Stn 17 Pk | 15.V.1987 | 60 | 20°26'1S | 36°16'3W |
| Stn 18 CP32 | 15.V.1987 | 1417-1440 | 20°20'9S | 36°19'0W |
| Stn 18 Pk | 15.V.1987 | 1417 | 20°19'8S | 36°18'1W |
| Stn 19 DC33 | 15.V.1987 | 865-900 | 20°29'5S | 36°12'9W |
| Stn 20 DC34 | 15.V.1987 | 54 | 20°27'7S | 35°54'4W |
| Stn 21 DC35 | 16.V.1987 | 82-15 | 20°42'3S | 35°22'0W |
| Stn 22 CP36 | 16.V.1987 | 4410-4440 | 21°20'8S | 34°52'9W |
| Stn 22 DS37 | 16.V.1987 | 4327-4335 | 21°15'3S | 34°53'9W |
| Stn 22 SY38 | 16.V.1987 | 4120 | 21°09'3S | 34°50'5W |
| Stn 22 SY39 | 17.V.1987 | 4200 | 21°11'4S | 34°54'0W |
| Stn 22 Pk | 16.V.1987 | 4400 | 21°21'0S | 24°50'3W |
| Stn 23 DC40 | 17.V.1987 | 60 | 20°39'8S | 34°41'1W |
| Stn 23 DC41 | 17.V.1987 | 58-70 | 20°38'5S | 34°42'9W |
| Stn 23 Pk | 17.V.1987 | 60 | 20°40'1S | 34°41'2W |
| Stn 24 DC42 | 17.V.1987 | 60 | 20°54'7S | 34°01'4W |
| Stn 24 Pk | 17.V.1987 | 60 | 20°54'3S | 34°01'1W |
| Stn 25 DC43 | 17.V.1987 | 63 | 20°50'9S | 33°44'6W |
| Stn 25 Pk | 17.V.1987 | 82 | 20°50'7S | 33°43'6W |
| Stn 26 CP44 | 18.V.1987 | 4500-4510 | 21°39'5S | 31°47'6W |
| Stn 26 SY45 | 18.V.1987 | 4542 | 21°43'1S | 31°44'3W |
| Stn 26 DS46 | 18.V.1987 | 4540-4545 | 21°43'6S | 31°42'9W |
| Stn 26 Pk | 18.V.1987 | 4500 | 21°39'6S | 31°50'7W |
| Stn 27 DC47 | 19.V.1987 | 94-105 | 20°41'6S | 32°12'9W |
| Stn 28 DC48 | 19.V.1987 | 250-300 | 20°44'3S | 32°08'0W |
| Stn 29 DC49 | 19.V.1987 | 944-945 | 20°43'7S | 31°56'7W |
| Stn 29 Pk | 19.V.1987 | 900 | 20°43'7S | 31°57'3W |
| Stn 30 DC50 | 19.V.1987 | 95-120 | 20°44'2S | 31°49'9W |
| Stn 31 DC51 | 20.V.1987 | 48-52 | 20°29'2S | 28°53'7W |
| Stn 31 Pk | 20.V.1987 | 58 | 20°29'1S | 28°52'8W |
| Stn 32 DC52 | 20.V.1987 | 64-80 | 20°29'2S | 28°51'8W |
| Stn 32 CP53 | 20.V.1987 | 54-69 | 20°28'8S | 28°51'8W |
| Stn 32 CP54 | 20.V.1987 | 120 | 20°28'9S | 28°51'6W |
| Stn 32 Pk | 20.V.1987 | 105 | 20°28'9S | 28°51'8W |
| Stn 33 DC55 | 20.V.1987 | 780-795 | 20°32'1S | 28°52'3W |
| Stn 33 Pk | 20.V.1987 | 880 | 20°31'5S | 28°55'1W |
| Stn 34 CP56 | 21.V.1987 | 4990-5092 | 20°33'8S | 28°19'8W |
| Stn 34 DS57 | 21.V.1987 | 5062-5100 | 20°32'1S | 28°27'3W |
| Stn 34 SY58 | 21.V.1987 | 5060-5100 | 20°23'9S | 28°27'3W |
| Stn 34 Pk | 21.V.1987 | 5155 | 20°33'9S | 28°18'9W |
| Stn 35 DC59 | 22.V.1987 | 52-60 | 20°30'4S | 29°18'5W |
| Stn 36 DC60 | 22.V.1987 | 100 | 20°30'5S | 29°18'5W |
| Stn 36 DC61 | 22.V.1987 | 63 | 20°29'2S | 29°18'2W |
| Stn 37 CP62 | 23.V.1987 | 4185-4192 | 20°02'1S | 33°27'4W |
| Stn 37 DS63 | 24.V.1987 | 4200 | 20°06'4S | 33°22'1W |
| Stn 37 SY64 | 24.V.1987 | 4207 | 20°06'2S | 33°18'0W |
| Stn 37 Pk | 24.V.1987 | 4207 | 20°07'7S | 33°18'1W |
| Stn 38 CP65 | 25.V.1987 | 3420-3442 | 19°01'6S | 37°29'3W |
| Stn 38 DS66 | 25.V.1987 | 3450 | 19°08'8S | 37°34'8W |
| Stn 38 SY67 | 25.V.1987 | 3450 | 19°13'3S | 37°33'4W |
| Stn 38 Pk | 25.V.1987 | 3460 | 19°12'7S | 37°31'7W |
| Stn 39 CP68 | 26.V.1987 | 1200-1500 | 18°55'6S | 37°49'1W |
| Stn 39 SY69 | 26.V.1987 | 1515 | 18°57'4S | 37°49'1W |
| Stn 39 DC70 | 26.V.1987 | 1540-1550 | 18°59'1S | 37°47'8W |
| Stn 39 CP71 | 26.V.1987 | 1560-1900 | 18°58'8S | 37°47'0W |
| Stn 39 Pk | 26.V.1987 | 1350 | 19°03'1S | 37°46'0W |
| Stn 40 DC72 | 27.V.1987 | 950-1050 | 19°00'4S | 37°48'8W |

| Station | Date | Depth | Latitude | Longitude |
|--------------|------------|-----------|----------|-----------|
| Stn 41 DC73 | 27.V.1987 | 607-620 | 18°59'5S | 37°48'2W |
| Stn 41 SY74 | 27.V.1987 | 682 | 18°58'1S | 37°48'5W |
| Stn 41 Pk | 27.V.1987 | 802 | 18°59'6S | 37°48'4W |
| Stn 42 DC75 | 27.V.1987 | 295 | 18°59'2S | 37°50'1W |
| Stn 42 CB76 | 27.V.1987 | 637 | 18°58'9S | 37°49'6W |
| Stn 42 PK | 27.V.1987 | 570 | 18°59'5S | 37°49'7W |
| Stn 43 CB77 | 27.V.1987 | 790-940 | 19°40'6S | 37°48'1W |
| Stn 44 CB78 | 27.V.1987 | 1200 | 18°58'8S | 37°48'4W |
| Stn 45 CB79 | 28.V.1987 | 1500-1575 | 19°01'8S | 37°47'8W |
| Stn 45 Pk | 28.V.1987 | 1575 | 19°03'0S | 37°48'7W |
| Stn 46 CB80 | 28.V.1987 | 290-315 | 18°59'9S | 37°49'6W |
| Stn 46 DC81 | 28.V.1987 | 120-135 | 19°00'3S | 37°47'5W |
| Stn 46 Pk | 28.V.1987 | 367 | 18°56'8S | 37°52'0W |
| Stn 47 DC82 | 28.V.1987 | 85-105 | 18°56'4S | 37°52'1W |
| Stn 48 DC83 | 28.V.1987 | 60 | 18°49'5S | 37°57'3W |
| Stn 48 CP84 | 28.V.1987 | 60 | 18°49'4S | 37°58'1W |
| Stn 48 Pk | 28.V.1987 | 61 | 18°49'3S | 37°57'3W |
| Stn 49 KU85 | 28.V.1987 | 1245 | 18°52'5S | 37°50'3W |
| Stn 50 KU86 | 29.V.1987 | 2400 | 18°49'8S | 37°46'3W |
| Stn 51 DC87 | 29.V.1987 | 15 | 19°34'9S | 39°42'1W |
| Stn 51 CP88 | 29.V.1987 | 20 | 19°35'3S | 39°40'3W |
| Stn 51 Pk | 29.V.1987 | 18 | 19°35'2S | 39°41'2W |
| Stn 52 CP89 | 29.V.1987 | 34 | 19°34'8S | 39°32'4W |
| Stn 52 CB90 | 29.V.1987 | 34 | 19°33'8S | 39°34'3W |
| Stn 52 SY91 | 29.V.1987 | 38 | 19°32'3S | 39°33'3W |
| Stn 52 Pk | 29.V.1987 | 40 | 19°34'8S | 39°32'4W |
| Stn 53 CB92 | 29.V.1987 | 340-360 | 19°34'2S | 38°55'0W |
| Stn 54 CB93 | 30.V.1987 | 640 | 19°36'0S | 38°53'3W |
| Stn 54 Pk | 30.V.1987 | 712 | 19°36'5S | 38°53'2W |
| Stn 55 CB94 | 30.V.1987 | 900 | 19°40'6S | 38°43'8W |
| Stn 55 CB95 | 30.V.1987 | 960 | 19°38'4S | 38°43'4W |
| Stn 56 CB96 | 31.V.1987 | 295-300 | 21°31'8S | 40°08'7W |
| Stn 56 Pk | 31.V.1987 | 295 | 21°34'1S | 40°10'9W |
| Stn 57 CB97 | 31.V.1987 | 600 | 21°33'9S | 40°08'4W |
| Stn 58 CB98 | 31.V.1987 | 900 | 21°35'1S | 40°31'0W |
| Stn 58 Pk | 31.V.1987 | 895 | 21°35'2S | 40°04'5W |
| Stn 59 CB99 | 31.V.1987 | 1190-1205 | 21°36'2S | 39°58'1W |
| Stn 60 CB100 | 01.VI.1987 | 33-45 | 22°59'5S | 42°05'3W |
| Stn 60 CB101 | 01.VI.1987 | 50 | 22°58'4S | 42°06'3W |
| Stn 60 Pk | 01.VI.1987 | 37 | 22°59'1S | 42°06'4W |
| Stn 61 CB102 | 01.VI.1987 | 100 | 23°07'4S | 42°04'0W |
| Stn 61 Pk | 01.VI.1987 | 100 | 23°00'1S | 42°03'9W |
| Stn 62 CB103 | 01.VI.1987 | 200-217 | 23°36'4S | 42°01'7W |
| Stn 62 Pk | 01.VI.1987 | 202 | 23°37'6S | 42°01'5W |
| Stn 63 CB104 | 01.VI.1987 | 430-450 | 23°41'6S | 42°06'5W |
| Stn 64 CB105 | 02.VI.1987 | 610 | 23°46'7S | 42°10'1W |
| Stn 64 Pk | 02.VI.1987 | 590 | 23°46'9S | 42°09'7W |
| Stn 65 CB106 | 02.VI.1987 | 830 | 23°54'2S | 42°10'5W |
| Stn 65 Pk | 02.VI.1987 | 800 | 23°53'8S | 42°12'2W |
| Stn 66 CB107 | 02.VI.1987 | 1020 | 23°00'3S | 42°14'4W |
| Stn 67 CB108 | 02.VI.1987 | 1555 | 24°12'4S | 42°15'8W |
| Stn 67 Pk | 02.VI.1987 | 1550 | 24°12'6S | 42°15'9W |